

Show all work on a *separate sheet* of paper. **This review is not comprehensive, be sure to study your old notes, tests, and homework assignments!**

1. Divide $(6x^2 - 7x - 5) \div (3x - 5)$ and express the answer in the form: $q(x) + \frac{r}{divisor}$:
2. Show that $(x - 2)$ is a factor of $P(x) = x^3 - 3x^2 - 10x + 24$, and find the other two factors.
3. What is the remainder when $3x^{107} + 14x^{35} - 16x$ is divided by $(x - 1)$?
4. Determine if $(x + 3)$ is a factor of $f(x) = x^3 + x^2 - 5x + 3$
5. If $(x + 16)$ is a factor of $f(x)$ then what is one of the zeros?
6. If $f(x) = (x - 3)(2x - 1)(3 + x)$ then what are the roots?
7. If $f(8) = 0$, what is one of the factors of $f(x)$?
8. Find the complete factorization of $f(x) = x^3 + 2x^2 - 8x$
9. Determine the equation of a cubic function whose zeros are -1, -2, and -3
10. What is the domain of $f(x) = \sqrt{x - 8}$?
11. What is the domain of $f(x) = \frac{1}{\sqrt{x - 2}}$?
12. What is the domain of $f(x) = \frac{1}{x^2 - 16}$?
13. If $f(x) = 3x + 1$ and $g(x) = x^2 - 3$, what does $g(f(x))$ equal (in simplest form)?
14. If $f(x) = x^2 - 3$ and $g(x) = 5x - 4$, what is the value of $(g \circ f)(3)$?
15. The quadratic function $f(x)$ has a turning point at $(5, -8)$. If $g(x) = f(x + 7) - 3$, what are the coordinates of the turning point of $g(x)$?
16. Given that $f(x)$ has x-intercepts at $x = -9$ and $x = 3$, if $g(x) = f(3x)$, where does $g(x)$ have x-intercepts?

17. Which set of ordered pairs does not represent a function?

- a) $\{(3, -2), (-2, 3), (4, -1), (-1, 4)\}$
- b) $\{(3, -2), (3, -4), (4, -1), (4, -3)\}$
- c) $\{(3, -2), (4, -3), (5, -4), (6, -5)\}$
- d) $\{(3, -2), (5, -2), (4, -2), (-1, -2)\}$

18. For the function $f(x)$ it is known that $(-12, 4)$ lies on the function. A second function, $g(x)$, is defined by the formula $g(x) = f(2x) - 3$. Describe the transformations that occur to the graph of $f(x)$ in order to produce the graph of $g(x)$. What point must lie on $g(x)$?

19. Given the parabola $f(x) = -(x-8)^2 + 5$, describe three transformations which would transform the graph of $g(x) = x^2$ into the graph of $f(x)$. Give both the transformations and the order in which they occur.